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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/626,762	07/24/2003	Steven G. Walker	YOR920030303US1	1740

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EXAMINER	
GARBOWSKI, LEIGH M	

ART UNIT	PAPER NUMBER
2825	

DATE MAILED: 12/19/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)
	10/626,762	WALKER ET AL.
	Examiner	Art Unit
	Leigh Marie Garbowski	2825

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *10 October 2005*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-38* is/are pending in the application.

4a) Of the above claim(s) *14-31* is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-13 and 32-38* is/are rejected.

7)☒ Claim(s) *33 and 35* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *24 July 2003* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892) 2 sheets

2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)

3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date *07/24/2003*.

4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .

5) ☐ Notice of Informal Patent Application (PTO-152)

6) ☐ Other: _____.

Election/Restrictions

Applicant's election without traverse of Group I, Claims 1-13 and 32-38, in the reply filed on 10/10/2005 is acknowledged.

Claim Objections

Claims 33 and 35 are objected to because of the following informalities: as per claim 33, the antecedent basis for "constraint measurements" and "sanity measurements" is not clear, as claim 1 does not provide support for the former, and as claims 1 and 6 do not provide support for the latter. Also, "noise measurement" is repeated [lines 3 and 6]. As per claim 35, "constraint and sanity measurements" do not find support in claims 1 and 6 as similarly noted above. Appropriate correction is required.

Claim Rejections - 35 USC § 112

The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claim 38 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

What is particularly meant by "the formulation of the circuit optimization problems" is not clear; the language is vague considering that neither claim 1 nor claim 6 pointedly recite the formation of "problems". Thus, the claim is confusing and indefinite.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claims 1-13, 32-38 are rejected under 35 U.S.C. 103(a) as being unpatentable over Conn et al. ["A Derivative Free Optimization Algorithm in Practice"].

As per claims 1 and 33-38, Conn et al. teach a method for optimizing, comprising: a. providing an objective to be minimized, and one or more independently tunable parameters to a derivative-free optimizer, the objective being defined as an objective measurement of behavior; b. receiving a value of each of the one or more independently tunable parameters from the derivative-free optimizer; c. providing each of the one or more independently tunable parameter values to a circuit simulator; d. receiving from the simulator the value of the objective measurement; e. providing the objective value to the derivative-free optimizer; and f. repeating steps (b) through (e) until the derivative-free optimizer determines that the objective has converged to a minimum within a convergence tolerance [Abstract, sections 1-3 and 5]. Although the reference does not explicitly state "simulator" it is understood that the simulation referred to does employ a simulator. However, Conn et al. do not teach behavior of a circuit, the example provided is drawn to helicopter rotor design. Considering that Conn et al. remark that "applications of this framework are frequently encountered in engineering" [section 1, paragraph 2], and suggest other examples of application [section 1, paragraph 4], a person of ordinary skill in the art at the time of the invention would have been motivated to use the method of Conn et al. for optimizing an electrical circuit because the problem is solved using as few evaluations as possible [section 1, paragraph 1]. As per claim 2, in which the goal of the optimization is to maximize the objective [sections 1 and 2]. As per claim 3, in which each of the one or more independently tunable parameters has one of an upper bound, a lower bound, both an upper and lower bound, and neither an upper nor lower bound [sections 1-3]. As per claim 4, in which the objective to be minimized in a continuous function of one or more objective measurements [sections 1-3, 5]. As per claim 5, in which one or more additional dependent tunable parameters are simultaneously optimized, each of the one or more additional dependent tunable parameters being defined as a continuous function of the one or more of the independently tunable parameters [sections 1-3].

As per claims 6 and 33-38, a method for optimizing, comprising: a. providing an objective to be minimized, one or more constraints to be met, and one or more independently tunable parameters to a derivative-free optimizer, the objective being defined as an objective measurement of behavior and each of the one or more constraints being defined as a constraint measurement of behavior; b. receiving a value of each of the one or more independently tunable parameters from the derivative-free optimizer; c. providing each of the one or more independently tunable parameter values to a circuit simulator; d. receiving from the simulator the value of the objective measurement and the value of each of the one or more constraint measurements; e. providing the objective value and the value of each of the one or more constraints to the derivative-free optimizer; and f. repeating steps (b) through (e) until the derivative-free optimizer determines that the objective has converged to a minimum subject to the one or more of the constraints to within a convergence tolerance [Abstract, sections 1-5]. Although the reference does not explicitly state "simulator" it is understood that the simulation referred to does employ a simulator. However, Conn et al. do not teach behavior of a circuit, the example provided is drawn to helicopter rotor design. Considering that Conn et al. remark that "applications of this framework are frequently encountered in engineering" [section 1, paragraph 2], and suggest other examples of application [section 1, paragraph 4], a person of ordinary skill in the art at the time of the invention would have been motivated to use the method of Conn et al. for optimizing an electrical circuit because the problem is solved using as few evaluations as possible [section 1, paragraph 1]. As per claim 7, in which the goal of the optimization is to maximize the objective subject to satisfying each of the one or more constraints [sections 1 and 2]. As per claim 8, in which each of the one or more independently tunable parameters has one of an upper bound, a lower bound, both an upper and lower bound, and neither an upper nor lower bound [sections 1-3]. As per claim 9, in which each of the one or more constraints is one of an equality constraint, less-than inequality constraint and greater than inequality constraint [sections 1-4]. As per claim 10, in which each of the one or more constraints is one of a linear constraint and a nonlinear constraint [section 4]. As per claim 11, in which the objective to be minimized

is a continuous function of one or more objective measurements [sections 1-3]. As per claim 12, in which each of the one or more constraints is a continuous function of one or more constraint measurements [section 4]. As per claim 13, in which one or more additional dependent tunable parameters are simultaneously optimized, each of the one or more additional dependent tunable parameters being defined as a continuous function of the one or more independently tunable parameters [sections 1-5].

As per claim 32, in which the simulation of the circuit is in one or more of the time and frequency domains [sections 1-2].

Claims 1-13 and 32-38 are rejected under 35 U.S.C. 103(a) as being unpatentable over Trahan et al. ["A Derivative-Free Algorithm for a Class of Infinitely Constrained Problems"].

As per claims 1 and 33-38, a method for optimizing, comprising: a. providing an objective to be minimized, and one or more independently tunable parameters to a derivative-free optimizer, the objective being defined as an objective measurement of behavior; b. receiving a value of each of the one or more independently tunable parameters from the derivative-free optimizer; c. providing each of the one or more independently tunable parameter values to a circuit simulator; d. receiving from the simulator the value of the objective measurement; e. providing the objective value to the derivative-free optimizer; and f. repeating steps (b) through (e) until the derivative-free optimizer determines that the objective has converged to a minimum within a convergence tolerance [see the entire document, particularly the underlining]. Although the reference does not explicitly state "simulator" it is understood that the simulation referred to does employ a simulator. However, Trahan et al. do not teach behavior of a circuit. Considering that the Abstract notes "the transcription of engineering design specifications" and that the Introduction suggests "for use in optimization-based computer-aided design" [paragraph 1], at the time of the invention a person of ordinary skill in the art would have been motivated to use the method of Trahan et al. for optimizing an electrical circuit because the designer has the flexibility of controlling the algorithm if used interactively [Conclusions]. As per claim 2, in which the goal of the optimization is to maximize the objective [section II]. As per claim 3, in which each of

the one or more independently tunable parameters has one of an upper bound, a lower bound, both an upper and lower bound, and neither an upper nor lower bound [section II]. As per claim 4, in which the objective to be minimized in a continuous function of one or more objective measurements [section II]. As per claim 5, in which one or more additional dependent tunable parameters are simultaneously optimized, each of the one or more additional dependent tunable parameters being defined as a continuous function of the one or more of the independently tunable parameters [sections II-IV].

As per claims 6 and 33-38, a method for optimizing, comprising: a. providing an objective to be minimized, one or more constraints to be met, and one or more independently tunable parameters to a derivative-free optimizer, the objective being defined as an objective measurement of behavior and each of the one or more constraints being defined as a constraint measurement of behavior; b. receiving a value of each of the one or more independently tunable parameters from the derivative-free optimizer; c. providing each of the one or more independently tunable parameter values to a circuit simulator; d. receiving from the simulator the value of the objective measurement and the value of each of the one or more constraint measurements; e. providing the objective value and the value of each of the one or more constraints to the derivative-free optimizer; and f. repeating steps (b) through (e) until the derivative-free optimizer determines that the objective has converged to a minimum subject to the one or more of the constraints to within a convergence tolerance [[see the entire document, particularly the underlining]. Although the reference does not explicitly state "simulator" it is understood that the simulation referred to does employ a simulator. However, Trahan et al. do not teach behavior of a circuit. Considering that the Abstract notes "the transcription of engineering design specifications" and that the Introduction suggests "for use in optimization-based computer-aided design" [paragraph 1], at the time of the invention a person of ordinary skill in the art would have been motivated to use the method of Trahan et al. for optimizing an electrical circuit because the designer has the flexibility of controlling the algorithm if used interactively [Conclusions]. As per claim 7, in which the goal of the optimization is to maximize the objective subject to satisfying each of the one or more constraints [section II]. As per claim 8, in which each of the

one or more independently tunable parameters has one of an upper bound, a lower bound, both an upper and lower bound, and neither an upper nor lower bound [section II]. As per claim 9, in which each of the one or more constraints is one of an equality constraint, less-than inequality constraint and greater than inequality constraint [sections II-IV]. As per claim 10, in which each of the one or more constraints is one of a linear constraint and a nonlinear constraint [sections II-IV]. As per claim 11, in which the objective to be minimized is a continuous function of one or more objective measurements [sections II-IV]. As per claim 12, in which each of the one or more constraints is a continuous function of one or more constraint measurements [sections II-IV]. As per claim 13, in which one or more additional dependent tunable parameters are simultaneously optimized, each of the one or more additional dependent tunable parameters being defined as a continuous function of the one or more independently tunable parameters [sections II-IV].

As per claim 32, in which the simulation of the circuit is in one or more of the time and frequency domains [sections II-IV].

Conclusion

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. See form PTO-892.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Leigh Marie Garbowski whose telephone number is 571-272-1893 and e-mail is Leigh.Garbowski@uspto.gov. The examiner can normally be reached on days.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Matthew Smith can be reached on 571-272-1907. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

LEIGH M. GARBOWSKI
PRIMARY EXAMINER